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THE NATIONAL ENERGY PLAN

OPTIONS UNDER ASSUMPTIONS OF NATIONAL SECURITY THREAT

Or

Energy Policy As If It Really Mattered

A REPORT

PRINTED AT THE REQUEST OF

JOHN D. DINGELL, *Chairman*

SUBCOMMITTEE ON ENERGY AND POWER, COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE
UNITED STATES HOUSE OF REPRESENTATIVES

AND

JOHN GLENN, *Chairman*

SUBCOMMITTEE ON ENERGY, NUCLEAR PROLIFERATION, AND FEDERAL SERVICES, COMMITTEE ON GOVERNMENTAL AFFAIRS
UNITED STATES SENATE

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LETTER OF TRANSMITTAL

U.S. SENATE,
COMMITTEE ON GOVERNMENTAL AFFAIRS,
SUBCOMMITTEE ON ENERGY, NUCLEAR
PROLIFERATION AND FEDERAL SERVICES,
Washington, D.C.

Hon. HARLEY O. STAGGERS,
Chairman, Committee on Interstate and Foreign Commerce, U.S. House of Representatives, Rayburn House Office Building, Washington, D.C.

Hon. ABRAHAM RIBICOFF,
Chairman, Governmental Affairs Committee, U.S. Senate, Dirksen Senate Office Building, Washington, D.C.

DEAR MR. CHAIRMAN: At our request, the Library of Congress has prepared an analysis of additional tools available to the U.S. Government in its efforts to induce significant changes in the direction of our national energy policy. A copy of this analysis, entitled "The National Energy Plan: Options Under Assumptions of National Security Threat", is enclosed.

The central thesis of this paper is that if there are important national security implications to our present energy posture, then we should recognize those implications and take action to reduce the very real risks to which we are presently exposed. We have taken similar steps in the past. Such steps could be taken now, if needed. Although we may not agree with all aspects of this analysis, it is thought provoking and worthy of further study.

We have a national responsibility to examine all of the ranges of steps which might be taken to reduce our vulnerability, and not merely those endorsed in the National Energy Plan. In our view, the enclosed report merits careful review; we intend to forward it to the DOE with a request that they provide that review.

Sincerely,

JOHN D. DINGELL,
Chairman,
Subcommittee on Energy and Power.
JOHN GLENN,
Chairman, Subcommittee on Energy,
Nuclear Proliferation, and Federal Services.

LETTER OF SUBMITTAL

LIBRARY OF CONGRESS,
CONGRESSIONAL RESEARCH SERVICE,
Washington, D.C., February 17, 1978.

Hon. JOHN D. DINGELL,
Chairman, Subcommittee on Energy and Power,
U.S. House of Representatives, Washington, D.C.

DEAR MR. DINGELL: I am pleased to submit a report to you, entitled "The National Energy Plan: Options Under Assumptions of National Security Threat." The report and selected readings were prepared and compiled by the Environment and Natural Resources Policy Division. Frances A. Gulick and Joseph P. Biniek, Analyst and Specialist, respectively, were responsible for the preparation and compilation of these materials.

As you requested, the report addresses the energy problem in the context of an assumed national security threat along the lines postulated by the executive branch over the past year. The text and the appended readings illustrate options available for Government action under this assumption.

I hope this report will be useful to you and your committee in your continuing consideration of energy policy options.

Sincerely,

GILBERT GUDE,
Director, Congressional Research Service.

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FOREWORD

The quote by William James used by President Carter in describing the U.S. energy situation as the "moral equivalent of war" has now been sufficiently repeated to warrant its designation as a cliche. Nonetheless, the reality of the situation that led to the President's energy message is increasingly apparent. The ability of the United States to meet its present and projected energy demand with domestic resources is decreasing. One result of this has been an increasing reliance on imported fuels.

In addition to detrimentally affecting the world economic balance, heavy U.S. dependence on foreign fuel supplies could pose a future threat to national security. The disastrous effects of an interruption in fuel supply were seen during the 1973 oil embargo and the winter of 1976–77 natural gas shortages, and are being seen now as a result of the recent nationwide coal strike. Future oil embargoes could cripple the United States and put it at the mercy of the major oil-supplying nations, thus seriously threatening national security.

The President's National Energy Program deals with domestic energy problems and solutions. However, since the energy situation has international implications as well, it is equally important to address potential international problems, in particular the threat to national security, and to know what options are available to the Federal Government to deal with such problems.

As the chairmen of our respective subcommittees, we independently requested the Congressional Research Service of the Library of Congress to conduct a study to identify the types of programs that could adequately deal with an energy-induced national security crisis. Whether we agree with all of the analysis or not, the report compiled by Ms. Frances A. Gulick and Joseph P. Biniek of CRS in response to our requests will be a useful aid to anyone concerned with the formation and implementation of national energy policies.

JOHN D. DINGELL,
Chairman, Subcommittee on Energy and Power,
Committee on Interstate and Foreign Commerce,
House of Representatives.

JOHN GLENN,
Chairman, Subcommittee on Energy;
Nuclear Proliferation, and Federal Services,
Committee on Governmental Affairs, U.S. Senate.

Abstract

PURPOSE AND SCOPE

In presenting his national energy program, the President based his case for that set of extraordinary measures on a perception of a serious threat to national and free world security. That threat would mature to crisis in the mid-1980's, as projected by the President, when world suppliers of oil would be unable or unwilling to provide enough oil to meet world needs and prevent economic chaos. In this analysis, the dependence of the U.S. and the free world on imported oil places free world economic, political, and military health at grave near-term risk, requiring an accelerated program to reduce oil import dependence and a shift to other fuels, all with the equivalent of wartime urgency, vigor, and scale.

During the ensuing months of executive and congressional action, many commentators have noted that neither the concrete elements of the President's plan nor the nature and pace of congressional action have been consistent with a credibly projected near-term national security crisis.

In response to a congressional request, this paper explores the types of programs and rationales that would be consistent with a credible, near-term national security threat of the nature described above, based upon analogous or comparable war-related mobilizations in the past. This analysis does not assess the relative merits of the President's projection of national security threat of crisis dimensions against other less drastic interpretations but accepts that projection and the need for wartime emergency measures as assumptions for this paper.

THE LEADING EXECUTIVE ROLE

A serious threat to national security always calls for a leading Federal role. In previous instances, the executive branch has taken the responsibility for getting done whatever was necessary. Congress has provided support, funds, oversight, and sometimes legislative authority after the fact.

In an energy crisis that threatens the national security, the executive branch could be expected to assume and exercise major authorities dealing with both the supply and the use of fuels and energy. Tasks which the executive branch has assumed in the past in situations of real emergency include:

1. Defining the nature of the threat to security.
2. Setting production targets and mobilizing the U.S. industrial base for expanding the domestic supply of fuels and energy, munitions and industrial products needed to meet the emergency.
3. Placing large orders for the goods and services required to carry out direct Federal operations.
4. Setting priorities for use of critical materials and restricting their use by industry.

5. Enlisting and mobilizing public and private participation and support.

6. Maintaining the strength of the international collective security system.

INDUSTRIAL MOBILIZATION FOR NATIONAL GOALS

In earlier instances of national security emergency, large scale direct Federal procurement of goods and services in pursuit of industrial production goals alined with national security objectives provided the primary Federal management tool by which such national goals could be both established and achieved.

Although the Federal Government set the production goals, the speed with which the targets were achieved depended on a close partnership between the Federal Government and private industry. This involved an exercise of Federal regulatory authority to allocate scarce materials, coupled with restrictions as required to limit nonpriority uses, which was put at the service of the U.S. private industrial production sector, and close mutual exchange of information.

A similar partnership is possible now to fulfill the quantitative goals set in the national energy plan, accelerating the production of equipment and facilities using renewable and other fuels alternative to oil, through large-scale Federal purchases for its own use of such items as the following:

1. Synthetic fuels, including oil from shale and coal, fuel from waste and gasoline substitutes.

2. Electric or other non-gasoline-using vehicles.

3. Solar heating and cooling, photovoltaic and wind energy conversion systems.

4. Industrial facilities for waste recycling, cogeneration of heat, environmental protection, hydro-electric turbines and generators, fluidized bed combustors and other equipment permitting retrofit for the use of fuels other than oil.

Since the Federal Government owns, annually procures, and maintains hundreds of thousands of buildings and vehicles for its own public services, accelerated procurement for replacing and retrofitting existing federally owned capital stock could be sufficient to underwrite and accelerate an expanding private industrial production capability in equipment using fuels other than oil.

The public market for such equipment may be enlarged by enlistment of State and local government purchases for which Federal fiscal or other assistance may be provided.

FEDERAL INTERVENTION IS LIMITED IN TIME

During World War II and the Korean war, substantial Federal intervention and redirection of private industrial production to meet national security production goals was accepted in large measure because it was conceived of as essentially temporary, "for the duration." There was general agreement on the wartime goals—defense of democracy, defeat of its foes—but there was also general agreement that, with victory, national production would revert to private hands, its output again determined by civilian consumption choices and needs.

Clearly, a direct analogy cannot be drawn with the present situation. "Victory" will not be "won" by 1985: Under the most optimistic scenario proposed, achievement of the plan's 1985 energy goals would still leave the United States depending on annual imports of about 6 million barrels of oil a day. However, the accelerated Federal procurement program explored in this paper as an option would not be needed after 1985. It is expected that by then private sector demand could and would take over the process of expanding the volume and scope of the Nation's conversion to the use of fuels other than oil.

THE CONGRESSIONAL ROLE

Historically, legislative measures enacted during periods of national security or wartime emergencies have served primarily to support Presidential initiatives and decisions with such additional tax and other authorizations and appropriations as were considered necessary. Any or all of the Executive measures outlined in the preceding section could be launched by the President under authorities and congressional consent procedures in laws still in force.

However, Congress is by no means prevented from taking much stronger initiatives independently or supplementing Executive initiatives in dealing with situations involving risk to national security. Congress retains and may wish to exercise the option to assume a much stronger leading role in the design and rationale of new national policies intended to reduce U.S. dependence on imported oil, and independently promote the Federal procurement and other oil import saving programs which could realize in time this national security goal.

The following paper, together with selected additional readings, elaborates some options available under the assumption that continuing substantial dependence on imported oil presents an unacceptable threat to the national security of the United States and its allies.

The National Energy Plan in National Security Terms

The President has defined the energy problem facing this country as one of grave and near-term danger to national security. He set U.S. energy demands in a world context, as an approaching crisis of the mid-1980's when world suppliers of oil would not be able or willing to export all the oil needed by the United States and the free world. The resulting international tensions, competition for imports of oil, and slowdown in the free world's economy would threaten "national catastrophe." The crisis point sometime in the 1980's, according to the President's perspective, is not self-imposed but will be determined by world events and trends which are now largely outside of domestic control.

THE PRESIDENT'S ASSESSMENT

In a nationwide address April 18, 1977, the President described the approaching dangers in very strong terms.[1]

Tonight I want to have an unpleasant talk with you about a problem that is unprecedented in our history. With the exception of preventing war, this is the greatest challenge that our country will face during our lifetime.

The energy crisis has not yet overwhelmed us, but it will if we do not act quickly * * *.

The oil and natural gas that we rely on for 75 percent of our energy are simply running out * * *.

Our Nation's economic and political independence is becoming increasingly vulnerable. Unless profound changes are made to lower oil consumption, we now believe that early in the 1980's the world will be demanding more oil than it can produce * * *.

We will constantly live in fear of embargoes. We could endanger our freedom as a sovereign nation to act in foreign affairs. Within 10 years, we would not be able to import enough oil from any country, at any acceptable price * * *.

Inflation will soar; production will go down; people will lose their jobs. Intense competition for oil will build up among nations and also among the different regions within our own country. This has already started.

If we fail to act soon, we will face an economic, social, and political crisis that will threaten our free institutions.

Seven months later, the President warned again of the encroaching threat to national security if the rising dependence on foreign oil is not reversed soon.[2]

If this trend continues, the excessive reliance on foreign oil could make the very security of our Nation increasingly dependent on uncertain energy supplies. Our national security depends on more than just our Armed Forces; it also rests on the strength of our economy, on our national will, and on the ability of the United States to carry out our foreign policy as a free and independent nation. America overseas is only as strong as America at home.

The Secretary of Defense said recently, "The present deficiency of assured energy sources is the single surest threat * * * to our security and to that of our allies."

---

[1] The President's address to the Nation, Apr. 18, 1977, in Weekly Compilation of Presidential Documents Monday, Apr. 25, 1977, vol. 13, No. 17.

[2] The President's address to the Nation, Nov. 8, 1977, in Weekly Compilation of Presidential Documents, Monday, Nov. 14, 1977, vol. 13, No. 46.

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STATEMENT BY THE SECRETARY OF DEFENSE

The Secretary of Defense elaborated this concern in his testimony before the House Ad Hoc Committee on Energy on May 4, 1977;[3]

I do believe my present responsibilities as Secretary of Defense make me aware of the very substantial impact, in fact, the crucial nature, of the energy shortage and of the need for a U.S. program to redress it. In fact, there is no more serious threat to the long-term security of the United States and to its allies than that which stems from the growing deficiency of secure and assured energy resources * * *.

The threat to national security, the economy and our way of life which arises from the energy crisis is not yet fully recognized by all. Some refuse to accept the fact that the energy crisis is real, and that its solution will require the development of a national policy and purpose commanding the dedication of the Nation, its resources, and its people over many years. Ultimately, the only alternative is disaster.

We are all familiar with the continuing risk of oil supply interruptions and upward pressures on prices from politically motivated embargos such as we experienced 4 years ago. Much less attention has been given to the potential for a much more serious interruption of oil supply by hostile forces in time of war. In the event of some future confrontation, the Soviet Union might be able to restrict access of the Western World to its essential oil supplies to a degree of severity and duration greater than any embargo by the oil producers. The U.S.S.R. might attempt to deny access to the oil of the Persian Gulf by direct attack on the facilities of the major oil-loading ports, which lie near Soviet territory. Simultaneous action to interdict on the high seas tanker movement of oil from other exporting nations could vastly exacerbate the oil supply situation for the United States and its allies.

The military, political, and economic risks of oil interruption are very real, and are steadily increasing as dependence on imported oil continues to grow * * *.

There is a third and greater energy threat to the Nation which has until recently received all too little popular attention, but which, as the President has said, should be the foremost consideration in development of national energy policy. This third threat is neither military nor political. It is, quite simply, resource depletion. A finite world supply of oil and gas will soon repeat the cycle so long evident in the United States. Growth in producible reserves will slow, halt and then go into decline as the remaining proven undiscovered resources grow smaller and the rate of discovery diminishes in the face of steadily increasing demand. The annual expansion in worldwide production which has been the foundation of 20th century world economic growth will level off and begin to decline.

Arguments that much greater hydrocarbon reserves remain to be discovered miss the point. A growing consumption rate assures that even if so they too will be quickly consumed * * *.

I believe there is comparatively little time for the United States to respond to the President's call and move toward reducing its dependence on imported oil. Failure to do so will impose increasing risks to our national security in the next few years and lead inexorably to the collapse of the world oil supply/demand balance in the next decade. Should that occur the effects on the security and economic viability of this Nation and the free world will be catastrophic.

Primary Federal Tasks in a National Security Response

Almost by definition and by law and precedent,[4] any program designed to cope with a serious threat to national security serves to legitimate a leading Federal role. This role involves several complementary activities:

[3] Hearings before the Ad Hoc Committee on Energy, U.S. House of Representatives, 95th Cong., 1st sess., on the National Energy Act. Hearings held on May 4, 5, and 12, 1977, pp. 69–72.

[4] Among general studies of earlier U.S. experience are: "The United States at War: Development and Administration of the War Program by the Federal Government"; prepared under the auspices of the Committee of Records of War Administration by the War Records Section, U.S. Bureau of the Budget, DeCapo Press, New York, 1972, 555 p. "Industrial Mobilization for War: History of the War Production Board and Predecessor Agencies, 1940:1945," vol. I, Program and Administration. Prepared by the Bureau of Demobilization, U.S. Civilian Production Administration, 1947, published by the U.S. Government Printing Office, 1069 pp. "Administrative Reflections from World War II," by Luther Gulick, University

PRIMARY EXECUTIVE RESPONSIBILITY

Previous experience has featured an executive branch with primary responsibility for shaping and launching the Nation's response, particularly to:

1. Identify the nature of the threat and design the response.
2. Set quantitative targets for industrial goods, manpower, production of additional munitions, fuels and other resources needed to offset or at least forestall the threat.
3. Direct large scale procurement of the goods and services needed;
4. Determine and award priority access to critical materials to serve production targets alined with national security goals, and restrict nonpriority uses when required.
5. Enlist and mobilize broad participation and support from State and local governments and the private sector as a whole;
6. Maintain the strength of the international collective security system.

THE SUPPORTING CONGRESSIONAL ROLE

The role of Congress in national security emergencies has been primarily one of authorizing and supporting executive initiatives, particularly to:

1. Authorize, where needed, the exercise of existing contingency emergency powers.
2. Enact additional tax, loan guarantees and investment write offs designed to accelerate industrial plant conversion and to offset wartime risks.
3. Appropriate additional funds as required to pay for federally procured goods and services or other programs to meet the goals;
4. Supplement executive policy and program initiatives with congressional proposals developed independently if executive programs appear to be inadequate.

The wartime experiences, including the prewar periods of preparation, from which these generalized precedents have been drawn are not directly comparable, even with each other: World War II involved much more widespread controls and more complete mobilization and conversion to war production of the national industrial base than did the Korean or the Vietnam wars.

In all instances, however, large-scale, direct Federal procurement of goods and services, in pursuit of production goals alined with national security objectives, provided the primary Federal management tool by which such national production goals could be both established and achieved.

National Energy Principles in the Context of a National Security Response

The President presented 10 fundamental principles as the underlying rationale for the national energy plan and the framework within which present and future policies must be formulated.[5]

of Alabama Press, 1948, 139 p. Industrial production experience during World War II and the Korean War was reviewed and analyzed in "Materials Shortages. Selected Readings on Energy Self Sufficiency and the Controlled Materials Plan." Prepared by CRS for the permanent Subcommittee on Investigations of the Committee on Government Operations. U.S. Senate. Committee print, August 1974, 256 p. and "Workshop on Resource Management," Committee print, report published by the same Senate committee, February 1975, 76 p.

[5] The National Energy Plan, pp. 25-32.

THE 10 PRINCIPLES

In summary, the 10 principles are:

(1) The energy problem can be effectively addressed only by a government that accepts responsibility for dealing with it comprehensively and by a public that understands its seriousness and is ready to make necessary sacrifices.

(2) Healthy economic growth must continue.

(3) National policies for the protection of the environment must be maintained.

(4) The United States must reduce its vulnerability to potentially devastating supply interruptions.

(5) The program must be fair. The United States must solve its energy problems in a manner that is equitable to all regions, sectors, and income groups.

(6) The cornerstone of national energy policy is that the growth of energy demand must be restrained through conservation and improved energy efficiency.

(7) Energy prices should generally reflect the true replacement cost of energy.

(8) Both energy producers and consumers are entitled to reasonable certainty as to Government policy.

(9) Resources in plentiful supply must be used more widely and the Nation must begin the process of moderating its use of those in short supply.

(10) The use of nonconventional sources of energy—such as solar, wind, biomass, geothermal—must be vigorously expanded.

There has been very little public disagreement with these principles. Although the plan's goals and accompanying programs and policies have been assessed in depth in a wide range of official and unofficial studies,[6] the principles themselves have received relatively little analysis and attention.

t may be useful to review the underlying rationale reflected in the principles to determine whether they reflect the national security dimensions and urgency of the energy problem which the President and the Secretary of Defense have publicly described.

The first, sixth, and seventh of the principles laid down in the national energy plan arguably do not.

THE FEDERAL ROLE

The national energy plan describes the Federal role as follows:

> The first principle is that the energy problem can be effectively addressed only by a Government that accepts responsibility for dealing with it comprehensively, and by a public that understands its seriousness and is ready to make necessary sacrifices. The declining availability of oil and natural gas will affect virtually all energy prices and consumption patterns in the United States, for the various energy supplies are all part of an integrated energy market. Therefore, in this democratic society, a solution can be found only in comprehensive Government policymaking informed by public comment and supported by public understanding and action.
>
> The Federal Government can pass laws and encourage action. State and local governments can play active roles. But this society can function at its best only when citizens voluntarily work together toward a commonly accepted goal. Washington can and must lead, but the Nation's real energy policy will be made in every city, town, and village in the country.

[6] See annex I for a list of these studies and summary report on the oil import savings assessments.

Comment

The fact that "declining availability of oil and natural gas will affect virtually all energy prices and patterns of consumption in the United States" may not be considered a self-evident reason for "comprehensive Government policymaking." A substantial congressional and public constituency has argued the opposite case, namely, that to remove current Government price and other regulatory controls on oil and natural gas would enable the economy as a whole to adjust to a new "integrated energy market" with consumption patterns much more efficiently geared to the realities of declining oil and natural gas supplies, as prices rise to meet near-term replacement costs measured by or against the price of imported oil.

If, however, the rationale can be persuasively recast so as to reflect the threat to national and free world security, as the energy problem is elsewhere defined by the President, the assertion of a Federal policymaking role would presumably be far less objectionable to the public.

The rationale could be rephrased along these lines:

The first principle is that the energy problem can be effectively addressed only by a Government that accepts responsibility for dealing with it comprehensively, and by a public that understands its seriousness, and is ready to make necessary sacrifices.

The declining availability of oil and the increasing dependence of the United States and the free world on oil imports whose availability in volume sufficient to meet world demand cannot be assured presents an unacceptable risk to national and free world security. Therefore, a solution should be found in comprehensive executive and congressional leadership, informed by public comment, and supported by public and private understanding and action.

THE ROLE OF CONSERVATION AND PRODUCTION

Further possible incongruity between the problem and the principles as defined is revealed in the sixth principle of the plan, which sets forth the rationale for a dominant conservation role:

The sixth principle, and the cornerstone of national energy policy, is that the growth of energy demand must be restrained through conservation and improved energy efficiency. Conservation and improvement in energy efficiency is the most practical course of action for the United States and for the nations of the world. Conservation is cheaper than production of new energy supplies, and is the most effective means for protection of the environment.

Comment

As stated, this principle—as well as the complementary 9th and 10th principles calling for switching from oil to use of plentiful fuels and renewable resources—fails adequately to suggest the massive production effort on the other side of the demand–supply equation, which must be accomplished within a very short period of time.[7] To do this will require large-scale replacement of existing petroleum-fueled capital stock with new equipment using other fuels, or large-scale construction of synthetic oil production capacity using domestic raw materials or some combination of these. This, in turn, would require very substantial production efforts which, under the national security emergency thesis, would need to be accelerated to virtually wartime production rates.

[7] This point is made in, among others, the GAO, CRS, OTA and University of Texas staff assessments of the plan. See annex I for citations to these and other studies of the plan.

Production of insulation is already insufficient to meet current demand. The manufacture of heat pumps and cogeneration facilities requires expanded production capacity that will need fuels and energy. When the fuel switching goals are added, the volume of production of new and improved energy-using equipment contemplated is formidable: Fluidized bed combustors, scrubbers, and other facilities to prevent environmental damage, a wide variety of solar-collecting and solar-using hardware, recycling equipment, solid waste conversion plants, methane and methanol and ethane and ethanol production systems, electric cars, batteries and recharging units. Production of these kinds of industrial equipment must be in addition to the massive production effort implied in the plan's fuel balance tables to increase domestic supplies of nuclear energy, from 1976 levels of 1.0 MMb/doe to 3.8 MMb/doe; coal, from 7.9 MMb/doe to 14.6 MMb/doe; and domestic oil, from 9.7 MMb/d to 10.6 MMb/d.

To repeat, reduction of oil import dependence will not take place as a result of belt tightening alone; a major production effort will be required to produce the products which use non-petroleum-based fuels alternative to oil and use all fuels more efficiently.

The language used in the plan's statement of this principle, comparing the costs of conservation to production of new energy supplies,[8] suggests a failure to identify the fact that the financial problems confronted by energy *users*, on whose individual decisions the plan heavily relies, are very different from those of oil and natural gas *producers*.

Oil and natural gas producers have traditionally financed new investment out of current cash flows, rather than through borrowing. Few energy end-users, small or large, residential or industrial, enjoy such luxury. Most must borrow at commercial rates.

Furthermore, oil and gas producers have a guaranteed market for their products for a long time to come, and can reasonably expect that profits will not diminish in the near future. Industrial energy users called upon to switch from oil and gas to alternative fuels when there may still be 10 or more years of economical and productive use in existing boiler or generating plant risk losing competitive markets for their products if the full cost of the added capital plant replacement is passed on the the consumer, or taking a substantial cut in profits if it is not. Even greater risks face the individual householder whose available cash and credit may already be stretched to the limit.

The continued sluggishness in the U.S. and free world economies discourages bold private investments now for a future postpetroleum age.

The sixth principle could be enlarged to reflect the reality that a massive industrial and energy production effort will be needed even to achieve the plan's own quantitative goals [9] and that Federal procurement of industrial goods enabling large-scale conversion to fuels other than oil may be needed to meet the goals within the time frame of 1985. That principle might be restated:

> The cornerstone of national energy policy is that the nation's dependence on imported oil must be reduced through accelerated programs to achieve conservation and improved efficiencies of energy use concurrent with a major energy and industrial production effort to permit the necessary switching to fuels other than

[8] i.e. "Conservation is cheaper than production of new energy supplies."
[9] These goals are listed on p. 13 below.

conventional oil and natural gas, without damage to the environment. Federal procurement contracts should be used to accelerate and expand the capital plant production and conversion efforts needed in the private sector to meet the Plan's quantitative goals.

ENERGY PRICING CONCEPTS

Similarly, the seventh principle, which sets the basic framework for the plan's energy pricing policies, appears to suggest that the size and pace of national production and conversion effort designed to deal with threats to national security should be left primarily to individual and collective market choice:

The seventh principle underlying the national energy plan is that energy prices should generally reflect the true replacement cost of energy. Energy prices should move toward a level that reflects the true value of energy in order for market signals to work in harmony with conservation policy. When the cost of expensive foreign oil is averaged with cheaper domestic oil, consumers overuse oil. Government policy that promotes overuse by artificially holding down prices misleads consumers into believing that they can continue to obtain additional quantities of oil at less than its replacement cost.

Artificially low prices for particular energy sources also distort interfuel competition. The artificially low price of natural gas, for example, has encouraged its use by industry and electric utilities, which could use coal, and has made gas unavailable for new households, which could make better use of its premium qualities.

Neither Government policy nor market incentives can create additional oil or gas in the ground. But from a long-term perspective, prices are an important influence on production and use. As long as energy consumers are enticed into believing that they can continue to pay yesterday's prices for tomorrow's energy, they will continue to use more energy than the Nation can really afford, U.S. resources will be rapidly exhausted, and continued overuse will make the inevitable transition more sudden and difficult.

Although producers need incentives for exploration and new development, pricing policies should not give them windfall profits unrelated to their economic contribution. If producers were to receive tomorrow's prices for yesterday's discoveries, there would be an inequitable transfer of income from the American people to the oil and gas producers, and producers' profits would be excessive.

Comment

This pricing approach does not appear consistent with the President's placement of the national energy problem in the context of grave impending danger to United States and free world security, and with the fact that the presidentially projected period of time to prepare for and surmount—or at least forestall—the threat is limited.

It is generally accepted that in times of national emergency or threat to security, Government intervention in the market to preempt and redirect resources to meet the emergency or danger is justified.

Under these circumstances, existing pricing concepts are likely to be superseded by other pricing arrangements adapted to the particular emergency. In some instances, this may involve strict price controls over either the whole economy or, on a more selective basis, over materials and products in short supply, in order to control inflation. Emergencies are also likely to involve expanded Government procurement of necessary equipment, materials, or services in which the negotiated price may, for example, include a premium to offset financial risk or be calculated on a cost-plus-fixed-fee basis.

Additional subsidies or other incentives have also been made available for emergency situations, such as war risk insurance, extraordinary grants or loans for construction of new or expanded industrial plants including, where necessary, construction of plants to produce capital equipment in support of an expanded industrial base.

Nor has Government intervention designed specifically to distort market pricing in the public interest been limited to emergency conditions. For 50 years, the United States followed a *de facto* national energy policy that deliberately chose to subsidize private producers to produce oil and natural gas, with the objective of providing expanding energy supplies at the lowest possible cost consistent with reliability of supply. The policy served the United States' domestic social goals for many years. It enhanced personal mobility and economic choice to an extent that would otherwise have been unattainable in an area as vast as this continent and, through the second-hand car market, enabled a qualitative "redistribution of wealth" which has been envied even in more centrally planned economies.

The Federal Government may decide that subsidies on an equivalent or greater scale may be required if the use of unconventional sources of energy is, as intended by the plan, to be "vigorously expanded." [10]

If revised and expanded to include a pricing option which discriminates in favor of renewable and recycled fuels so as to rapidly expand their availability and use, the rationale for future energy and investment pricing principles might be phrased along these lines:

> The pricing and investment principles underlying the National Energy Plan include the concept that the prices for oil and natural gas, as for their more abundant but nonrenewable substitutes of coal and uranium, should generally reflect the replacement cost of imported oil.
>
> The subsidies provided for investment in equipment to manufacture or use renewable and recycled fuels, however, should generally reflect within 5 years the full replacement cost of capital needed for these tasks. This should apply to individual users who made such investments and to industrial users and producers of such equipment alike.
>
> Energy users of renewable and other fuels alternative to oil ought to be given incentives equivalent in scope and value to those which were given to producers to explore and develop oil.

With or without generous tax and other business subsidies reflecting privately assumed risks of wartime proportions, large scale Federal procurement may be needed to underwrite an expanded private industrial production capability and to guarantee a continuing market for the new fuel conservation and fuel conversion equipment and facilities needed to make the transition to a less oil dependent age.

During World War II and the Korean war, substantial Federal intervention and redirection of private industrial production to meet national security production goals was accepted in large measure because it was conceived of as essentially temporary, "for the duration." There was general agreement on the wartime goals—defense of democracy, defeat of its foes—but there was also general agreement that, with victory, national production would revert to private hands, its output again determined by civilian consumption choices and needs.

Clearly, a direct analogy cannot be drawn with the present situation. "Victory" will not be "won" by 1985: achievement of the plan's 1985 energy goals would still leave the United States depending on annual imports of about 6 million barrels of oil a day even if these goals could be met—and most analysts conclude that they cannot. (See annex I.) However, the accelerated Federal procurement program explored in

[10] National Energy Plan, p. ix, 31-2 and 75-81.

this paper as an option would not be needed after 1985. Under the assumptions stated in this paper, accelerated replacement of federally owned oil-using capital stock would have been largely achieved by 1985, and thus Federal procurement contracts could then revert to normal annual replacement levels.

The program could be designed such that, by then, demand in the private sector could and would be expected to drive the process of expanding the volume and scope of the Nation's conversion to the use of fuels other than oil.

A National Security Orientation for the National Energy Plan

What specific executive and legislative measures could be undertaken more rapidly to convert the Nation's stock of capital plant and equipment by 1985 and to mobilize its industrial productive capacity to meet the national security dangers addressed by the national energy plan?

EXECUTIVE MEASURES

The President and his advisers have already undertaken the first two of the tasks historically assumed by the Executive in situations presenting foreseeable dangers to national security, and many of the rest can be undertaken within the framework of the annual Federal budgets and under existing powers.

Define the nature of the threat to security

The President has identified the nature of the threat and designed a response, in the form of the national energy plan, and the proposed National Energy Act.

Set quantitative targets

The President has set quantitative targets, to be accomplished over a period of about 8 years, intended to meet three "overriding" energy objectives:

> 1. As an immediate objective that will become even more important in the future, to reduce dependence on foreign oil and vulnerability to supply interruptions;
>
> 2. In the medium term, to keep U.S. [oil] imports sufficiently low to weather the period when world oil production approaches its capacity limitations; and
>
> 3. In the long term, to have renewable and essentially inexhaustible sources of energy for sustained economic growth.[11]

Among the specific quantitative goals identified in the plan are the following intended to be achieved by 1985:[12]

> 4. Establish a Strategic Petroleum Reserve of 1 billion barrels;
>
> 5. Reduce gasoline consumption by 10 percent below the 1976 level (6.3 million b/d as compared with the 1976 consumption rate of 7 million b/d);
>
> 6. Increase coal production from 1976 output of about 600 million tons to more than 1 billion tons annually, anticipating

[11] National Energy Plan, Overview, p. xi.
[12] Ibid., pp. 83–4 and ff.

substitution of coal for oil or natural gas equivalent to 2.2 million b/doe for industrial uses and 1.1 million b/doe for utilities.[13]

7. Insulate 90 percent of the approximately 74 million existing residential units and all new buildings;

8. Install solar energy units in more than 2½ million homes;

9. Limit U.S. oil imports to 5.8 million b/d by 1985.

Place orders for large scale Federal procurement of goods and services

Except for purchases for the Strategic Petroleum Reserves, Federal procurement has not yet been employed on any significant scale to underwrite the capital plant conversion and production efforts required to achieve the quantitative goals of the plan.

The opportunities and authorities for an accelerated exercise of this power exist, however, and could, for example, be used in the following ways:

Synthetic fuels.—Long-term Federal contracts for procurement of oil from shale or other synthetic fuels for Department of Defense uses and stockpiling in the Strategic Petroleum Reserves could be negotiated on a cost basis. Pilot tests using synthetic fuels from coal, shale oil and tar sands have already been conducted under DOD-ERDA financing. DOD consumption of petroleum was 173 million barrels in 1976—about 450,000 barrels per day.

"Gasahol".—Federal multiyear contracts for purchase of various forms of nonpetroleum substitutes for gasoline and a Federal commitment to use such substitutes for at least 10 percent of gasoline consumed in federally owned vehicles could be used to guarantee a private sector industrial production capability for these fuels. This would amount to annual purchases of 1.6 million gallons of gasoline substitutes, at 1976 consumption levels.

Electric or other non-gasoline-using vehicles.—As of mid-1976, the Federal Government owned 425,226 motor vehicles, operated at an annual cost of $664.5 million (including depreciation) and using the equivalent of 16 million barrels of oil a year.[14] Excluding buses and ambulances, the Federal Government acquired 19,155 vehicles and disposed of 14,014 in 1976. Public Law 94–163, the Electric and Hybrid Vehicle Research Act, mandates Federal purchase or lease of 2,500 electric or hybrid vehicles by mid-1978 and an additional 5,000 by April, 1981, subject to certain conditions. It also calls for introduction of electric and hybrid vehicles into Federal fleets, including the U.S. Postal Service, GSA, DOD, and other agencies "as soon as possible." Incremental costs, as required, including differential operating costs may be underwritten by the ERDA budget. Accelerated and additional purchases would be possible through the annual Federal budget authorization and appropriation process.

Photovoltaic electric power generating panels, also federally procured, could be installed at Federal facilities or at gasoline stations serving Federal fleets, as supplementary battery recharging services for electric vehicles.

Solar heating and cooling and photovoltaic energy systems.— Programs included in the National Energy Act, as tentatively agreed to by both House and Senate conferees, call for installation of solar heating and

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[13] Data on anticipated substitution provided in Hearings before the Ad Hoc Committee on Energy, on the NEA, op. cit., Administration testimony and tables, pp. 210–11, submitted in response to questions by Congressman John Dingell, May 12, 1977.

[14] Federal leased vehicles are not included in this total.

cooling in about 3,000 Federal buildings in 3 years, at a cost of $100 million, and installation of up to 30 megawatts of photovoltaic energy systems, at a cost of $98 million over 3 years. Both Federal purchase programs were intended to accelerate the commercialization of solar energy and, in the case of photovoltaics, to

> temporarily create, through Government procurement, a large enough market for solar cells so that mass production techniques will be instituted in their manufacture, thus driving down the cost of the cells and consequently stimulating a higher private demand for the solar cells.[15]

Since the Federal Government owns over 400,000 buildings, additional Federal procurement could be used to purchase and install such equipment in many thousands more buildings to expand more rapidly the industrial production capacity of the private sector and to standardize prices and performance criteria for these products. If final action on the National Energy Act is delayed, Federal procurement can be authorized and funded through the annual Federal departmental authorization and appropriations process.

Other Federal procurement orders.—Federal procurement contracts could also be employed to enlarge and underwrite the market for waste recycling, cogeneration systems, wind energy conversion systems environmental protection equipment, fluidized bed combustion devices, and other equipment needed to convert Federal industrial and electric power generating plants from the use of oil and gas to coal, installing them in all facilities now operated by the Federal Government, including the Department of Defense, ERDA laboratories, and the major Federal power administrations—Bonneville, Alaska, Southwestern, and Southeastern.

In a report, "Estimate of National Hydroelectric Power Potential at Existing Dams," published July 20, 1977, the U.S. Army Corps of Engineers concluded that the development of all hydropower potential at existing dams could generate 160 billion Kwh of electricity and save 727,000 barrels of oil per day. Only 5,500 of the 49,500 dams in the United States are owned and operated by the Federal Government. Under a national security rationale, the Federal Government could elect the option of assuming the full capital cost of developing the maximum potential in all other dams as well, whether publicly or privately owned, in order to accelerate the availability of this additional supply.

Determine priority access to critical materials and restrict uses when required by national security

Under the Defense Materials System and the Defense Priorities System, the Department of Commerce and the General Services Administration have authority, delegated by the President, to allocate scarce material for production of items deemed essential for national security. This is done under procedures first adopted in World War II, subsequently authorized under the Defense Production Act of 1950, as amended, recently extended through September 30, 1979 by, Public Law 95–37.

These authorities have been invoked for production of equipment needed for the Alaska Pipeline and could be invoked, if needed, for expanded production of capital goods and equipment using renewable

[15] Report of the Committee on Energy and Natural Resources, U.S. Senate, on S. 2057, National Energy Conservation Policy Act, S. Rept. 95–409, August 1977, p. 66.

and other fuels alternative to oil, such as those suggested in the previous section.

The President also has authority under section 232 of the Trade Expansion Act of 1962, as amended, to limit imports of any commodity upon a finding that such limitation is required to prevent impairment of national security.

In a recent decision involving imposition of oil import fees, the Supreme Court ruled that the President's authority to limit imports for national security reasons included the authority to do so by means of license fees and was not limited to the use of quantitative methods such as quotas.[16]

The President's power to redirect energy uses by quantitative limitation is augmented by powers enacted in EPCA (Public Law 94–163, Section 457) which authorize him to impose direct controls on refinery operations to adjust the proportions of residual fuel oil, gasoline, or any other refined petroleum product if he determines such adjustment is necessary to provide for public health, safety and welfare, and the national defense.

Enlist and mobilize broad public and private sector participation and support

During World War II and the Korean War, a significant component of the high level of popular support for the national defense effort derived from the enlistment of private sector participation in the production planning process, as well as in the production effort.

Although production goals and priorities were set by the executive branch, the pace of production was determined by private industry. The planning procedures and accelerated production pace depended on close consultation and continuing detailed exchange of information on materials requirements and progress of the industrial production efforts at all levels and stages. This close mutual involvement in the planning process helped to produce a sense of national partnership that tended to transcend contractual relationships.

Large-scale Federal procurement in support of quantitative energy goals could also help to mobilize popular participation and support for a national energy plan cast in national security terms. Negotiations on the terms and scheduling of substantial contracts for the production of synthetic fuels and equipment using non-petroleum-based fuels provide both the ends and the means for direct enlistment of the private sector in broader participation in planning for and achieving these national energy goals.

A national industrial production program geared to the achievement of accepted energy goals provides a valid base for national or local campaigns to sell energy production or fuel conversion bonds and stamps to mobilize both extra capital and popular support.

The public market represented by Federal procurement could be substantially broadened by Presidential enlistment of State Governors and county and municipal executives in a similar expanded procurement effort to convert State and local capital plant and equipment in publicly owned and financed facilities and services to renewable and other fuels other than oil.

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[16] *Algonquin SNG* vs. *FEA*, U.S. Supreme Court Docket No. 75-382, June 17, 1976. See also Cabinet Task Force on Oil Import Control, The Oil Import Question: A Report of the Relationships of Oil Imports to the National Security, GPO, February 1970. pp. 2-7, and 19-55.

The overall size and mix of a public market for synthetic fuels, vehicles fueled by alternatives to oil, solar equipment, waste conversion and recycling plants, efficient coal using combustors and environment protection devices, district heating and cogenerating facilities, depends on projected demand. Contracts to meet this demand will require consultation and mutual cooperation between the Federal Government and State and local governments, between the public purchaser and the private producers.

Large-scale Federal procurement orders can provide a clear and unambiguous evidence of Federal commitment to the declared national security energy goals. The planning, contract negotiation, and production processes themselves could be a means, once more, by which a nation and its citizens can be convinced of the seriousness of the threat to national security created by our present dependence on imported oil and, having been convinced, mobilized in its defense.

Maintain the strength of the international collective security system

A threat to national security is by definition a danger that, if not resolved or forestalled, threatens either war or sufficiently massive political or economic disruption that our antagonists need not resort to war to achieve their aims.

It is the latter danger which the President foresees as facing the United States and its industrial allies and seeks to forestall sufficiently to:

> Weather the period when world oil production approaches its capacity limitation; and in the long term to have renewable and essentially inexhaustible sources of energy for sustained economic growth.[17]

The United States presently depends on oil for 47 percent of its total energy needs and is now importing nearly half of all oil consumed in this country. Other industrial democracies are still more vulnerable to supply interruptions: Western Europe depends on oil for 63 percent of its total domestic energy consumption, and imports 97 percent of that oil. Japan is 80 percent dependent on oil and imports all of it.

The volume of physical capital stock of oil-fueled vehicles, heating and cooling systems, industrial boilers, and generating plants which these proportions represent is gigantic. Much of this stock—for Europe and Japan as well as the United States—still has 10 years or more of usefulness. Much of this capital stock must be replaced much earlier by equipment and facilities using fuels other than oil if the security goal of reduced dependence on imported oil is to be achieved by the mid-eighties.

The collective security arrangements which have served to prevent the outbreak of global war have been successful because they were backed by, and negotiated from, a position of military, industrial, and economic strength. A critical element of that strength was the prompt supply of military and industrial goods and equipment transferred in large volume, by aid and trade, to the members of the North Atlantic Alliance by the United States, acting as the "arsenal for democracy."

As the President and the Secretary of Defense pointed out in their testimony, our continued and increasing dependence on imported

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[17] See p. 13 infra.

oil is weakening that industrial and economic stength and is making our military defense increasingly vulnerable as well, placing the whole postwar structure of international security at risk.

Achievement of the U.S. energy goals as stated by President Carter would undoubtedly play a major role in reducing U.S. vulnerability to interruptions in oil import supply but these goals may still leave U.S. allies exposed to unacceptable risks. U.S. security interests may require further expansion of U.S. industrial production capacity and delivery of an additional substantial volume of equipment using non-petroleum-based fuels to enable substantial replacement of our allies' oil-using capital stock earlier than would otherwise occur.

Federal procurement and delivery of such items can be done within the framework of existing collective security agreements and assistance programs. There is also historical precedent for assistance to NATO allies to increase their industrial capacity for equipment essential to collective security and free world strength. During the 1950's, U.S. assistance was provided for a joint military production program financing additional production capacity based in Europe for designated equipment. A similar joint program could be undertaken to accelerate production and use of equipment and facilities using fuels alternatives to oil.

LEGISLATIVE MEASURES

Historically, legislative measures enacted during periods of national security or wartime emergencies have served primarily to support Presidential initiatives and decisions with such additional tax and other authorizations and appropriations as were considered necessary. Any or all of the executive measures outlined in the preceding section could be launched by the President under authorities enacted in laws still in force. Legislative measures could be limited to no more than those required to fulfill such procedures as may be needed to authorize the exercise of some emergency powers,[18] to enact additional tax and other fiscal measures to raise revenues, and to appropriate funds as required to pay for federally procured goods and services or other programs administered by executive departments to meet national energy goals.

However, Congress has the major option of taking much stronger initiatives independently or supplementing executive initiatives in dealing with situations involving risk to national security.

The energy record of the 93d and 94th Congresses, and during the first session of the 95th Congress, provides concrete evidence that the legislative measures Congress may choose to enact by no means constitute passive endorsement of the energy initiatives of three Presidents who have urged early approval of their proposals.

Congress retains, and may wish to exercise, the option to assume a much stronger leading role in the design and rationale of new national policies intended to reduce U.S. dependence on imported oil, and independently to promote Federal procurement and other oil import saving programs which could advance this national security goal.

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[18] For example, although the President is ordered under EPCA to design and issue regulations for a contingency plan for gasoline rationing, additional formal congressional concurrence is needed before the President may order such a plan to be put into effect (Public Law 94-163, Section 201(c)).

FEDERAL PROCUREMENT OPPORTUNITIES FOR INCREASING PRIVATE SECTOR INDUSTRIAL PRODUCTION CAPACITY FOR SELECTED OIL-SAVING PRODUCTS

Oil-saving product	Potential Federal market	Potential oil savings
Synthetic oil (oil shale, from coal)-----	Annual Department of Defense use equals c. 180,000,000 bbl of petroleum (estimated, fiscal year 1978).	Up to 500,000 bbl of oil per day or 180,000,000 bbl of oil per year.
Electric or other non-gasoline-using vehicles.	Federal fleet (worldwide in 1976) equals 425,000 vehicles. Annual new vehicle purchases equals c. 20,000 vehicles.	Depends on degree of replacement of existing fleet: e.g., at 50 percent replacement equals 8,000,000 bbl of oil per year or c. 22,000 bbl of oil per day.
"Gasahol" (ethanol, methanol)-------	Annual gasoline use by Federal fleet equals 16,000,000 bbl of oil equivalent per year.	Depends on degree of substitution for fuel in remaining gasoline-using cars; e.g., at 20 percent equals 1,600,000 bbl of oil per year.
Photovoltaic and wind energy conversion systems.	400,000 federally owned buildings-----	Depends on degree of substitution; e.g., photovoltaic devices and solar hot water heaters could be installed in all 400,000 federally owned buildings.
Solar hot water and heating----------	In 1977, Federal buildings and facilities used 36,600,000 MWh of electricity and 22,000,000 bbl of fuel oil.	
Products which enable oil savings in industrial plants and utilities which burn oil (fluidized bed combustors, environmental protection equipment, cogeneration, district heating equipment, and waste-to-fuel equipment).	Not available at time of writing. DOD has about 55 large boiler plants in the United States which could be converted to coal.	Not available at time of writing.
Incremental hydroelectric power: Turbines and generators.	Federal Government owns only 5,500 of the 49,500 dams in the United States. If Federal procurement were employed to develop all the hydro potential of these 49,500 dams, additional power generated is estimated at about 160,000,000,000 kWh of electricity which equals 727,000 bbl of oil per day.	

Annex I.—National Energy Plan: Overview of the President's Proposals—Issue Brief No. IB77060

(By Frances A. Gulick, Environment and Natural Resources Policy Division)

[Excerpts]

Preliminary Assessments of the Impact of the Plan on the Oil Import Savings Goals

Four congressional agencies—the Congressional Budget Office (CBO), the Congressional Research Service (CRS), the General Accounting Office (GAO), and the Office of Technology Assessment (OTA)—have completed preliminary assessments of the President's proposed National Energy Plan, in response to requests from Committees and Members engaged in marking up the Administration's omnibus bills, H.R. 6831 and S. 1469. All of these are agreed, with minor differences, that the direct and indirect price and other economic impacts of the Plan itself would not produce results very different from what might take place without the Plan, with oil product price increases of between 7 to 12 cents a gallon believed likely (not counting the impact of the Administration's proposed gasoline tax, a measure dropped in the House).

All of these assessments, however, also conclude that the Plan, even if enacted as proposed, could not produce the quantitative oil savings effects targeted in the Plan's goals because of shortfalls which would occur in virtually all other quantitative goals.

CONGRESSIONAL BUDGET OFFICE

The CBO report, issued May 31, 1977, concluded that anticipated oil savings will reach only 3.6 million barrels a day, rather than the Administration's estimated 4.5 mb/d. About 0.6 of the 0.9 mb/d discrepancy, according to CBO calculations, results from lower estimates of coal conversion potential. The remaining 0.3 mb/d discrepancy is due to differing estimates of impact of home insulation and solar equipment tax credits.

THE CONGRESSIONAL RESEARCH SERVICE

Although no specific quantitative shortfall is provided, the initial CRS assessment, issued June 1, 1977, concluded that the Plan's estimated import savings are "optimistic and not likely to be achieved." Although imports probably will be higher than 7 mb/d, CRS analysts do not expect imports to exceed a ceiling of 12 mb/d, even without the Plan, because of other constraints.

A subsequent CRS report on "The Carter Coal Conversion Program," issued June 10, 1977, concluded that the 5.1 percent per year growth rate of energy input to industry forecast by the Plan from 1977 to 1985 is far too high. Based on historical performance of the U.S. economy since 1960, the rate would be closer to 3.1 percent, even subtracting recession-caused decreases, and would be further decreased by the effects of the Plan, as the Administration has since conceded. Furthermore, costs assumed in the Administration's calculations—estimated at $6.4 million for a 25 megawatt boiler plus $1.9 million for a scrubber—differ markedly from a number of other industry estimates, such as those presented in testimony to the Texas Industrial Commission in January 1977 (about $10 million without scrubber) and estimates made by the American Boiler Manufacturers Association (that scrubbing investment for a 25 megawatt boiler would be about $5 million rather than $1.9 million). The CRS report concludes:

"In sum, the Plan claims an increased coal use in industry of about 200 million tons in 1985. The concerns raised in this paper call into question some 140 million of these tons, 120 million tons of which result from an improbably high estimate of rate of growth of energy demand and the rest as the result of unreasonably low Plan estimates of the cost of coal-burning equipment."

GENERAL ACCOUNTING OFFICE

In a preliminary review of the Plan released on June 8, 1977, the GAO strongly criticized the Administration for proposing a Plan which could not meet its own goals, and concluded that further shortfalls would occur:

"We generally agree with these goals and believe that they can form the basis for developing a national energy policy between now and 1985. On the basis of our prior work, we believe that there is a serious energy problem and that the goals proposed by the National Energy Plan provide a useful way to address this problem. One fact that has not been widely recognized, however, is that the Administration did not design its Energy Plan to achieve the stated goals without unspecified voluntary actions or further mandatory actions not specifically identified except by example. Based on the Administration's own estimates, with a few exceptions, the plan will fall short of the goals—even if the Plan is fully implemented."

The GAO cited the following goals and administration estimates as evidence for this internal Plan discrepancy:

ADMINISTRATION'S PROPOSED ENERGY GOALS FOR 1985	ADMINISTRATION'S ESTIMATE OF WHAT THE PLAN CAN ACCOMPLISH THROUGH 1985
Reduce total energy growth to below 2 percent/year.	Reduction to 2.2 percent.
Reduce oil imports below 6 million barrels/day.	Reduction to 7 million barrels/day.
Insulate 90 percent of all buildings.	Insulate approximately 60 percent.
Use solar energy in 2.5 million homes.	Use solar energy in 1.3 million homes.

The report concluded:

"We believe that it is somewhat incongruous to ask the Congress to establish a set of National Energy Goals, and then propose a National Energy Plan that is not expected to achieve them. . . .

"Since under the best of circumstances, plans designed to meet goals often fall short, we believe that the plan should be redesigned to provide a reasonable opportunity of achieving the stated goals."

In its final version, issued July 25, 1977, the GAO concluded that the Administration's estimates for domestic energy supplies were overstated by a total of 3.9 mb/doe (of which coal shortfalls account for 2.3 mb/doe; natural gas, 1.0 mb/doe; and nuclear power, 0.6 mb/doe.) Consequently, the GAO believes oil imports would more likely be about 10.3 mb/d in 1985.

In a subsequent letter report issued October 14, the GAO released additional analysis of anticipated domestic oil production, concluding that crude oil production in the U.S. is more likely to be in the range of 8 to 9 mb/doe, rather than 10.6 mb/doe as the Administration has estimated: "This means that oil imports are more likely to be in the range of 12–13 mb/d instead of the 6 mb/d which is the Administration's goal."

OFFICE OF TECHNOLOGY ASSESSMENT

OTA (in prepublication draft analysis released June 24, 1977, and a final report issued August 1977) also has concluded that although the Plan is a major move in the right direction, the levels of supply projected by the Plan represent the upper limits of capacity and supplies of all fuels are likely to fall below the Plan's goals.

Two assessments of the degree of shortfall are contained in the report, one by a Task Force on Energy Supply, which attributes the shortages to a wide variety of probable logistical and regulatory delays, another by the OTA staff using 1950–1976 historical trends in energy supply and demand. The Task Force concluded that shortfalls of between 5.0 to 6.0 mb/doe would occur with shortages in oil and natural gas totalling between 2.0 and 3.0 mb/doe, as much as 2.4 mb/doe in coal, and 0.6 mb/doe in nuclear energy. These would be offset, however, by reduced coal demand about 2.4 mb/doe lower than the Administration estimates, leaving a net shortfall of 3.6 mb/doe. The OTA staff concluded that the gap between U.S. energy demand and domestic supply would widen to 16.5 mb/doe if the historical trends in demand (averaging 3% per year) do not change and if aggregate domestic energy production does not increase faster than historic trends indicate it will. The OTA staff report stated:

"The 'historic trends' analysis suggests that international shortages and price rationing are inevitable if United States oil import demands are not reduced. The basic question appears not to be whether the economy can continue to grow under more stringent conservation policies but whether conservation measures can take hold fast enough to head off the crippling impact of abrupt oil shortages in 1985."

OTHER ASSESSMENTS

Dr. Hans Landsberg, economist and senior fellow at Resources for the Future, in a mid-May review of the Plan's fuel balances (Plan, p. 96) also pointed out that these projections revealed projected results significantly at variance with the Plan's quantitative goals: Energy demand, according to the figures provided in the fuel balance tables, would grow at an average annual rate of 2.5 percent not 2 percent. He considered coal conversion and nuclear power additions to be overestimated due to foreseeable logistical difficulties, by as much as 3 mb/doe and concluded that the nation will need, in the absence of drastic mandatory conservation and conversion measures, "3.5 to 4 million barrels per day of oil above and beyond the target, or total 1985 oil import volume of 10.5 to 11 million barrels—if we are lucky, that is."

Another study, representing the "independent and individual evaluations" of some of the members of the faculty and staff of the University of Texas at Austin, issued May 11, 1977, places the oil import gap at 4.2 mb/d by 1985, primarily because production of oil, natural gas, and nuclear energy will be less than the Plan's balance sheet projections because of constraints (mainly price, according to these analysts) built into the Plan. Oil imports are likely to be as high as 11.8 mb/d by 1985 unless much more serious fuel production efforts are undertaken.

The International Economic Policy Association (Washington, D.C.) also issued a preliminary appraisal in June 1977, with special emphasis on the international economic implications of "America's Oil and Energy Goals." Pointing out that even if the Plan does achieve the goal (of 7 mb/d oil imports in 1985), the cost to the United States in that year would still be $37.1 billion (at a reference price of $14.52 per barrel, and in 1976 dollars). If imports do not drop to that level and reach 11.4 mb/d, the cost to the United States would rise to $60.9 billion for the year 1985 (also expressed in 1976 dollars and a $14.52 reference price).

ADMINISTRATION'S IEA STATEMENT

Energy Secretary James Schlesinger openly conceded shortfalls in the Plan in his statement to the governing board of the 19-member International Energy Agency (IEA) in Paris on Oct. 5, 1977:

"What we miss this year we are going back for next year. Indeed, we chose in January and the following months to gauge just about what we thought we could get through, recognizing that what we were proposing was a moderate program, [although] extraordinarily bold in relation to prior accomplishments in Washington, D.C. The goals were quite modest in terms of the gravity of the problem."

At the same meeting, the members of the IEA agreed to limit their combined oil imports to 26 mb/d by 1985. This will require all members other than the United States to hold imports at no more than current levels, and the United States to achieve a reduction in oil imports by 1985 to 5.8 mb/d, a renewed U.S. commitment which Secretary Schlesinger acknowledged other IEA members view with "understandable" skepticism.

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